We claim:

1. A process for preparing high-concentration gaseous formaldehyde having a molar CH_2O : H_2O ratio of ≥ 0.6 from an aqueous formaldehyde solution by evaporation of at least part of the solution, in which the aqueous formaldehyde solution is heated to a evaporation temperature T and the gas phase formed is taken off, wherein the evaporation temperature T obeys the relationship:

$$T\,[°C] \geq T'_{min}\,[°C]$$

where $T'_{min}(c) = A + B \times (c/100) + C \times (c/100)^2 + D \times (c/100)^3$
and
$A = +68.759$, $B = +124.77$, $C = -12.851$, $D = -10.095$,

where c is the instantaneous CH_2O content of the aqueous formaldehyde solution during the evaporation in percent by weight and is from 20 to 99% by weight.

2. A process as claimed in claim 1, wherein the aqueous formaldehyde solution used as starting material in the process has a CH_2O content of from 50 to 99% by weight.

3. A process as claimed in claim 2, wherein the aqueous formaldehyde solution has a CH_2O content of from 70 to 90% by weight.

4. A process as claimed in any of claims 1 to 3, wherein the pressure during the evaporation is from 0.1 to 50 bar.

5. A process as claimed in any of claims 1 to 4, wherein the molar CH_2O : H_2O ratio is ≥ 1.4.

6. A process as claimed in any of claims 1 to 5, wherein a temperature which obeys the relationship

$$T\,[°C] \geq T''_{min}\,[°C]$$

where $T^2_{min}(c) = A' + B' \times (c/100) + C' \times (c/100)^2 + D' \times (c/100)^3$
and

$A' = + 6.0156$, $B' = + 52.918$, $C' = + 49.699$, $D' = + 34.286$,

where c is the instantaneous CH_2O content of the aqueous formaldehyde solution during the evaporation in percent by weight and is from 20 to 99% by weight,
is maintained in the aqueous formaldehyde solution at every point in the evaporator.

7. A process as claimed in any of claims 1 to 6, wherein the evaporation is carried out in a stirred vessel, a helical tube, a film evaporator or another apparatus having heat exchanger characteristics.

8. A process as claimed in any of claims 1 to 7, wherein the aqueous formaldehyde solution used as starting material in the process is prepared by oxidative dehydrogenation of methanol.

9. The use of high-concentration gaseous formaldehyde obtainable by a process as claimed in any of claims 1 to 8 for preparing trioxane, tetraoxane, butynediol, diphenylmethanediamine and dioxolane.